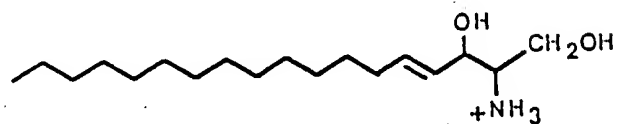


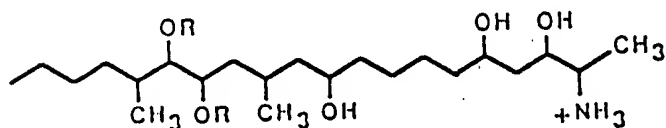
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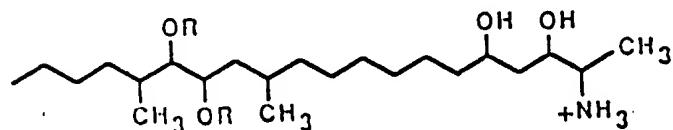
Figure 1



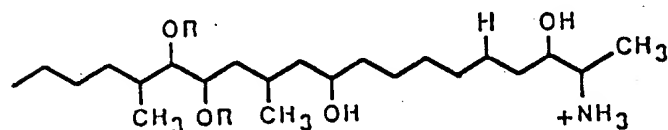
Sphingosine



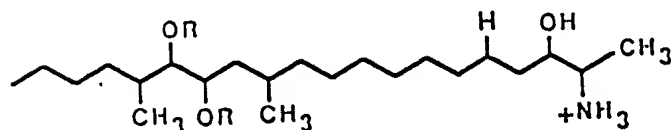
Fumonisin B₁



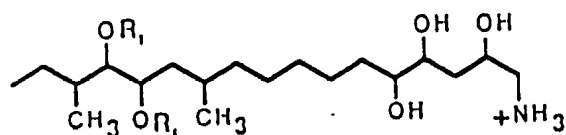
Fumonisin B₂



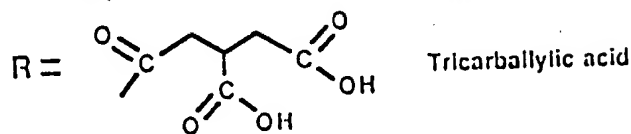
Fumonisin B₃



Fumonisin B₄



Alternaria toxins
(AAL toxins)
 $R_1 = H \text{ or } R$



Tricarballic acid



Fumonisin Analogs

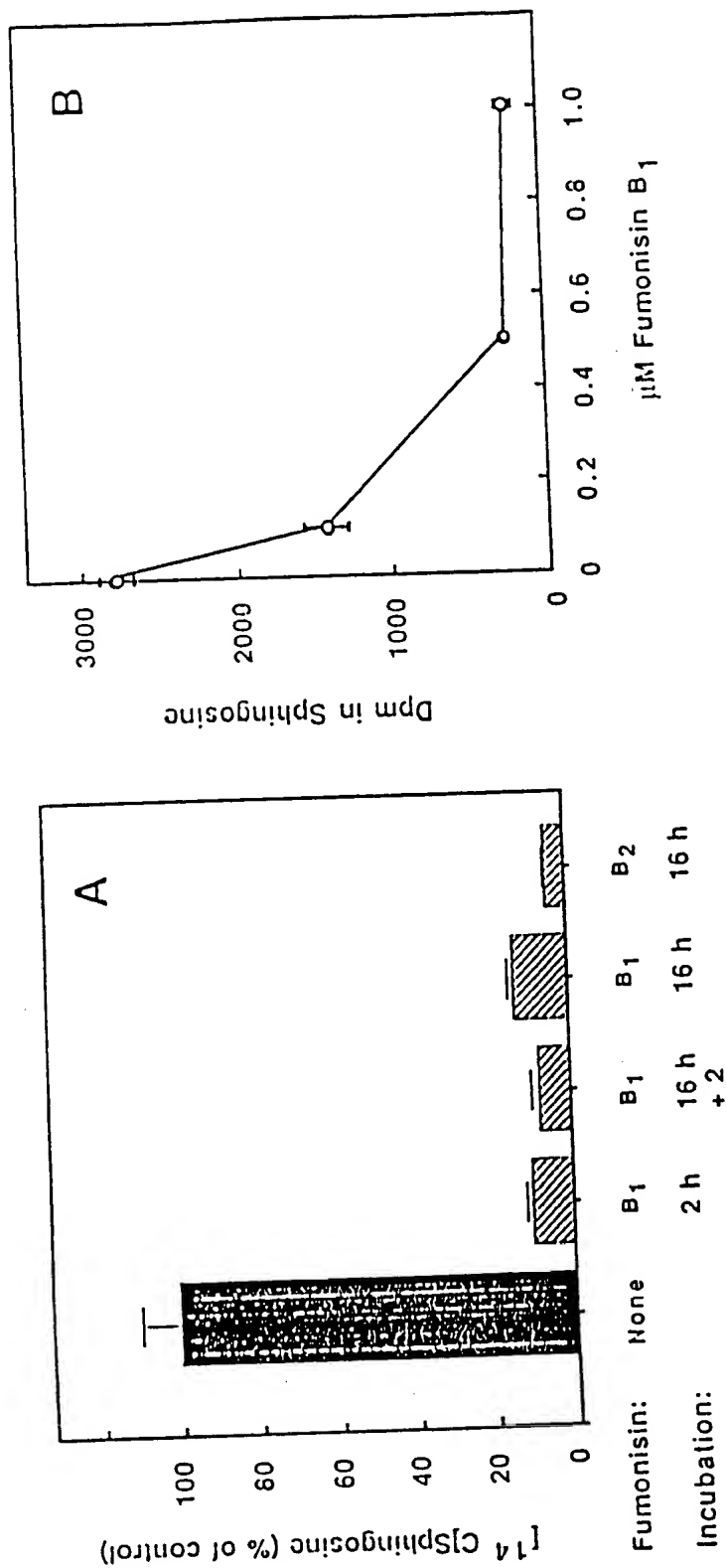


Figure 3

Figure 4

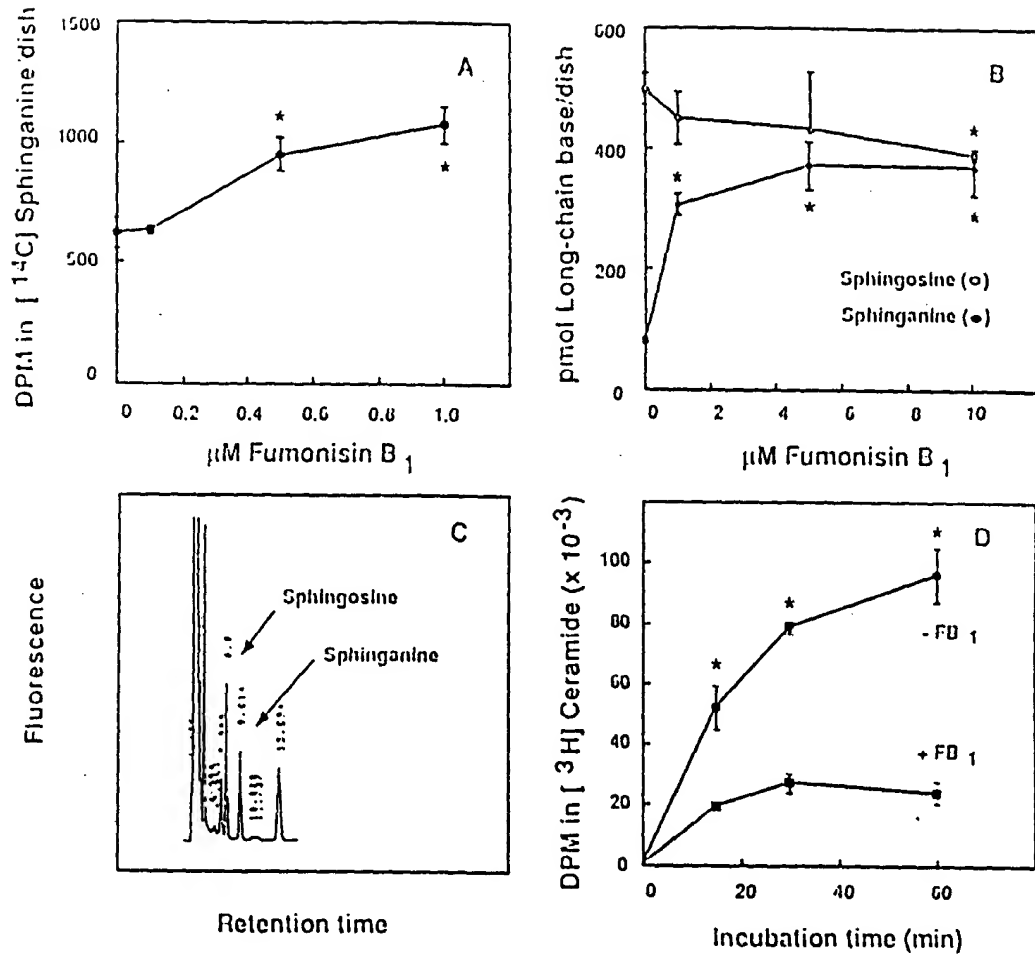
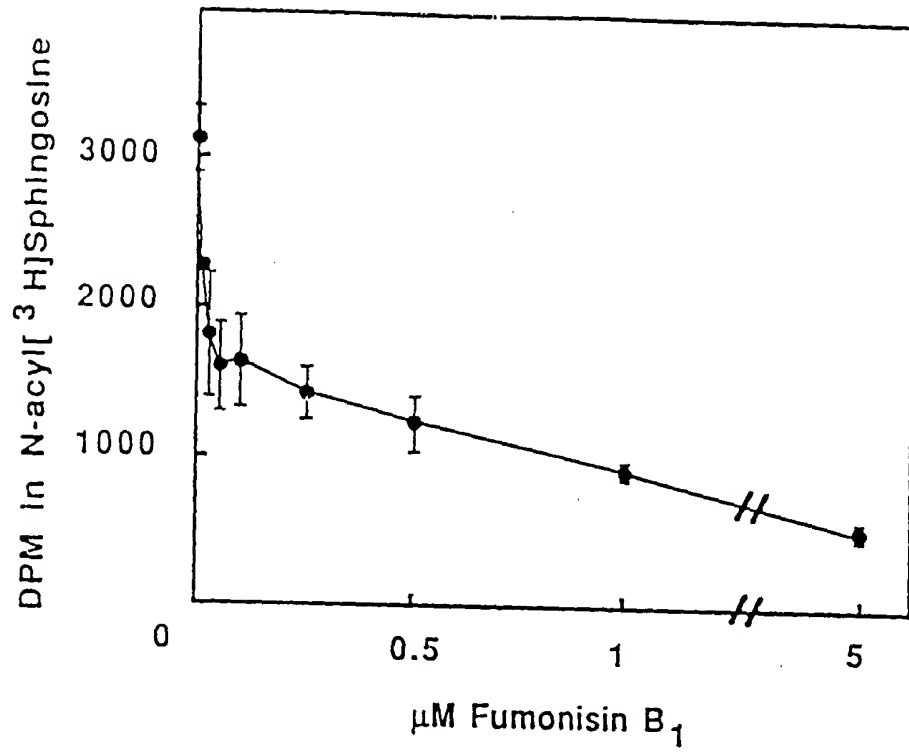


Figure 5



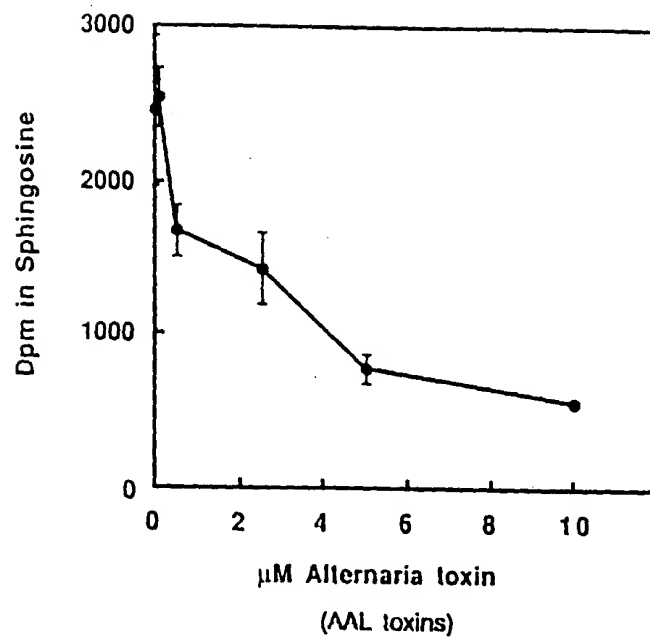


Figure 6

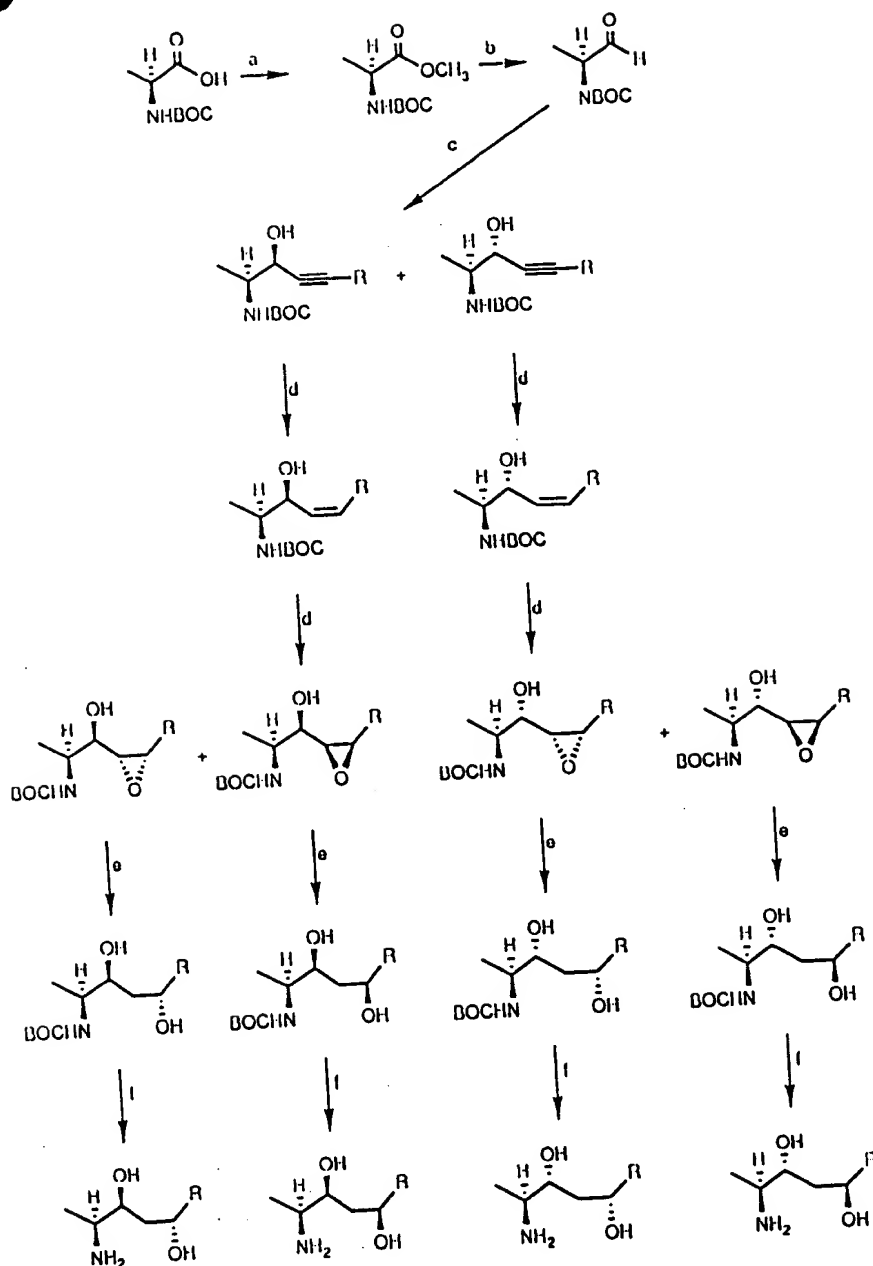
Figure 1 consists of four vertically stacked line graphs sharing a common x-axis representing 'Day' from 0 to 100. The top graph shows AST/SGOT levels, which peak sharply at day 10 (approx. 3000) and then fluctuate between 500 and 1000, with a final spike at day 95 (approx. 2300). The second graph shows the Sphinganine/Sphingosine Ratio, which peaks at day 10 (approx. 2.5), drops to a minimum around day 25 (approx. 0.8), and then fluctuates between 1.5 and 3.2. The third graph shows Sphingosine (pmol/ml) levels, which peak at day 10 (approx. 380), drop to a minimum around day 25 (approx. 60), and then fluctuate between 40 and 80. The bottom graph shows Sphinganine (pmol/ml) levels, which peak at day 10 (approx. 650), drop to a minimum around day 25 (approx. 20), and then fluctuate between 20 and 150.

Figure 1 consists of three vertically stacked line graphs sharing a common x-axis labeled "Day of Experiment" ranging from 0 to 250. A legend at the top indicates three experimental conditions: 15 ppm (hatched box), 22 ppm (hatched box), and X (white box). A vertical dashed line is drawn at day 150.

- Top Graph:** The y-axis is labeled "AST/SGOT" and ranges from 0 to 2000. The data shows a sharp increase starting around day 220, peaking at approximately 2100 around day 230, and then dropping to about 1100 by day 240.
- Middle Graph:** The y-axis is labeled "Sphinganine/Sphingosine Ratio" and ranges from 0.0 to 1.5. The data shows a sharp increase starting around day 220, peaking at approximately 1.8 around day 230, and then dropping to about 1.3 by day 240.
- Bottom Graph:** The y-axis is labeled "Sphinganine" and ranges from 0.1 to 1.0. The data shows a sharp increase starting around day 220, peaking at approximately 1.2 around day 230, and then dropping to about 1.1 by day 240.

Figure 8

CC(C)[C@H](C(=O)OCC)N + NH2HCl $\xrightarrow[\text{DMF}]{\text{Et}_3\text{N}/(\text{BOC})_2\text{O}}$ CC(C)[C@H](C(=O)OCC)N(C(=O)OC(C)(C)C)C **2**
CC(C)[C@H](C(=O)OCC)N(C(=O)OC(C)(C)C)C $\xrightarrow[\text{DMF}]{\text{DIBAL-H}}$ CC(C)[C@H](C(=O)OCC)N(C(=O)OC(C)(C)C)C=O **3**
CC(C)[C@H](C(=O)OCC)N(C(=O)OC(C)(C)C)C=O $\xrightarrow[\text{Benzene}]{\text{Ph}_3\text{PCHCHO}}$ CC(C)[C@H](C(=O)OCC)N(C(=O)OC(C)(C)C)C=CC=O **4**
CC(C)[C@H](C(=O)OCC)N(C(=O)OC(C)(C)C)C=CC=O $\xrightarrow[\text{Et}_2\text{O}]{\text{MgBrC}_{13}\text{H}_{27}}$ CC(C)[C@H](C(=O)OCC)N(C(=O)OC(C)(C)C)C=CC(O)CC(C)(C)CCCCCCCCCCCCCCCC **5**
CC(C)[C@H](C(=O)OCC)N(C(=O)OC(C)(C)C)C=CC(O)CC(C)(C)CCCCCCCCCCCCCCCC $\xrightarrow[\text{CH}_2\text{Cl}_2]{\text{mCPBA}/\text{NaHCO}_3}$ CC(C)[C@H](C(=O)OCC)N(C(=O)OC(C)(C)C)C1CCC(O)C(C1)CC(C)(C)CCCCCCCCCCCCCCCC **6**
CC(C)[C@H](C(=O)OCC)N(C(=O)OC(C)(C)C)C1CCC(O)C(C1)CC(C)(C)CCCCCCCCCCCCCCCC $\xrightarrow[\text{THF}]{\text{Red-Al}}$ CC(C)[C@H](C(=O)OCC)N(C(=O)OC(C)(C)C)C(O)C(O)CC(O)CC(C)(C)CCCCCCCCCCCCCCCC **7**
CC(C)[C@H](C(=O)OCC)N(C(=O)OC(C)(C)C)C(O)C(O)CC(O)CC(C)(C)CCCCCCCCCCCCCCCC $\xrightarrow{\text{HCl}/\text{EtOAc}}$ CC(C)[C@H](C(=O)OCC)N(C(=O)OC(C)(C)C)C(O)C(O)CC(O)CC(C)(C)CCCCCCCCCCCCCCCC **8**

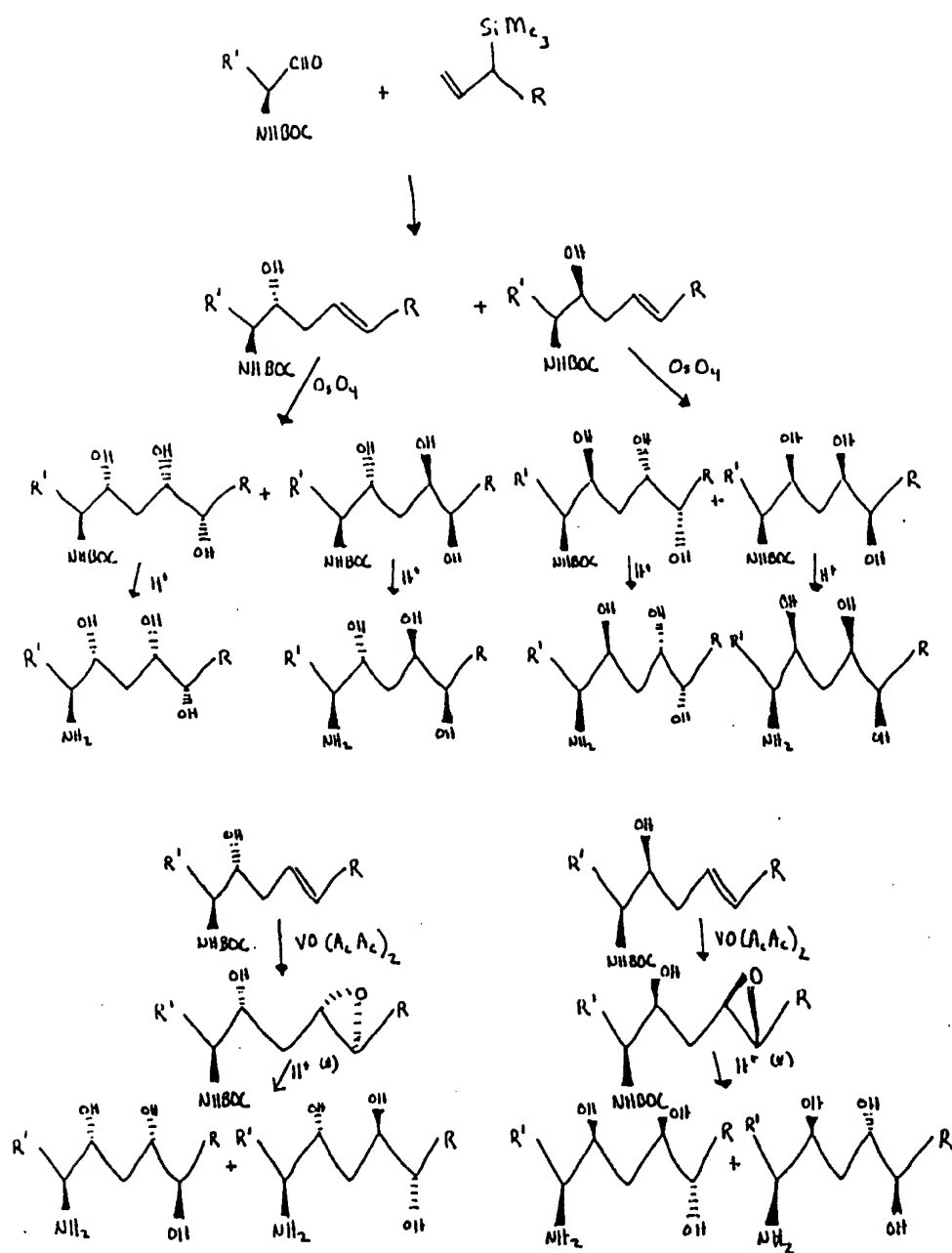


a. CH_2N_2 ; b. DIBAL; c. LiCCR; d. Peracid; e. NaBH_3CN ; f. H^+

R = alkyl (straight chain or branched, $\text{C}_8 - \text{C}_{20}$), hydroxy alkyl, amino alkyl, alkylcarboxy (same definition of alkyl), aryl, esters of the hydroxyalkyl and alkylcarboxy groups, amides of the aminoalkyl and alkylcarboxy groups.

Figure 10

Figure 11



R = alkyl (straight chain or branched, C_8-C_{20}), hydroxy alkyl, amino alkyl, alkylcarboxy (same definition of alkyl), aryl, esters of hydroxyalkyl and alkylcarboxy groups, amides of the aminoalkyl and alkylcarboxy groups

R' = H , CH_3 , C_2H_5 , CH_2O -Protecting Group

(*) Epoxide opening and removal of the BOC group may be more efficiently achieved using two discrete hydrolysis steps